

We claim:

1. A joint connector in which a male connector and a female connector are fit, comprising:

a male connector having a circuit board and male terminals provided on the circuit board at a predetermined interval and standing in one direction and in a direction intersecting therewith, the male terminals being conductively connected selectively with each other by a circuit pattern on the circuit board; and

a female connector in which connector housings each having a plurality of female terminals are stacked.

2. A male connector for a joint connector in which a male connector and a female connector are fit, comprising:

a circuit board; and

male terminals provided on the circuit board at a predetermined interval and standing in one direction and in a direction intersecting therewith;

wherein the male terminals are conductively connected selectively with each other by the circuit pattern on the circuit board, and the male terminals are interlockable with female terminals in a female connector in which one-stage parallel-line-shaped connector housings each having female terminals inserted and interlocked therein are stacked.

3. The joint connector according to claim 1, wherein the

circuit pattern on the circuit board is composed of a copper foil circuit, and the copper foil circuit is formed using a rolled material.

4. The male connector for a joint connector according to claim 2, wherein the circuit pattern on the circuit board is composed of a copper foil circuit, and the copper foil circuit is formed using a rolled material.

5. A joint connector including an inserting-side connector portion and a receiving-side connector portion in which the inserting-side connector portion is inserted, the inserting-side connector portion and the receiving-side connector portion being fitted and connected to each other, comprising:

an inserting-side connector portion including a plurality of connector housings each having a plurality of terminal-accommodating compartments juxtaposed along a lateral direction for accommodating connecting terminals, an interlocking recess portion provided on at least one of the connector housings, an interlocking protrusion portion interlocking therewith, and a connector housing-locking means for combining the connector housings stacked into a plurality of stages; and

a receiving-side connector portion including a connector case having an inserting-side connector portion-receiving compartment for receiving and holding the inserting-side

connector portion, and a circuit-forming unit being mounted to the connector case and having a plurality of connection pins protruding in the inserting-side connector portion-receiving compartment to be connected with the connecting terminals in the inserting-side connector portion;

wherein a clearance is provided between respective interlocking surfaces of an interlocking recess portion and an interlocking protrusion portion constituting the connector housing-locking means so that the interlocking protrusion portion is loosely interlocked with the interlocking recess portion, whereby the plurality of connector housings are loosely combined so as to be shiftable relative to each other.

6. The joint connector according to claim 5, wherein a plurality of protruding guide portions for forming a guide groove in which a side portion of a connector housing in the inserting-side connector portion are juxtaposed on an inner side wall of the inserting-side connector portion-receiving compartment in the receiving-side connector portion, and a width of the protruding guide portions gradually narrows toward an entrance of the inserting-side connector portion-receiving compartments while a width of the guide groove gradually widens.

7. The joint connector according to claim 5, wherein a lance is provided on one wall of each of the terminal-accommodating compartments in each of the connector housings in the inserting-side connector portion, the lance having a straddle

structure in which its base line end is supported by the wall though a pair of slits formed in a longitudinal direction of the terminal-accommodating compartments and being composed of an elastic interlocking piece in which a thick-walled built-up portion is formed on its back side and an interlocking protrusion interlocked with the connecting terminal is formed on its inner side, and a lance-receiving portion is provided at a corresponding location on another wall opposite to the lance, for receiving the built-up portion of the lance provided on a terminal-accommodating compartment in an adjacent connector housing when inserting the connecting terminals into the terminal-accommodating compartments; to permit displacement of the lance bending outwardly.

8. The joint connector according to claim 7, wherein a double interlocking rib for the connecting terminals is protruded on an outer side of the other wall located rearward of the lance provided on each of the terminal-accommodating compartments in each of the connector housing in an inserting-side connector portion, and an interlocking hole is provided at a corresponding location to the double interlocking rib on the one wall, for interlocking with a double interlocking rib protruding on a terminal-accommodating compartment of an adjacent connector housing.

9. A joint connector in which an inserting-side connector portion and a receiving-side connector portion are locked with

each other by a connector-locking means, comprising:

an inserting-side connector portion having a plurality of connector housings, in each of which a plurality of terminal-accommodating compartments for accommodating female terminals are juxtaposed in a single layer, the connector housings stacked in a plurality of stages and combined; and

a receiving-side connector portion having a connector case in which the inserting-side connector portion is inserted, and a plurality of male terminals protruding in the connector case and being connected to the female terminals of the connector housings in the inserting-side connector portion;

wherein the connector-locking means is provided at a lateral side location when viewed from the inserting direction so as to lock a side portion of the connector housing in the inserting-side connector portion and a sidewall of the connector case in the receiving-side connector portion.

10. The joint connector according to claim 9, wherein the connector-locking means is provided at both side locations so as to lock both side portions of at least one of the connector housings in the inserting-side connector portion and both side walls of the connector case in the receiving-side connector portion.

11. The joint connector according to claim 9, wherein the connector-locking means comprises an engagement recess portion and an engaging claw portion composed of an elastic piece having

at its fore-end a claw for engaging the engagement recess portion, the engagement recess portion being provided on a side portion of at least one of the connector housings in the inserting-side connector portion and the engaging claw portion being provided in a cantilevered fashion on a side wall of the connector case in the receiving-side connector portion.

12. The joint connector according to claim 9, wherein the connector-locking means comprises an engagement recess portion and an engaging claw portion composed of an elastic piece having at its fore-end a claw for engaging with the engagement recess portion and a curved tab diagonally extending outwardly with respect to the claw so as to be in a substantially Y-shape.

13. A joint connector to be connected to an external connector, in which male terminals of a circuit-forming unit are inserted into female terminals of the external connector inserted in a connection case, comprising:

- a connection case into which the external connector for accommodating a plurality of female terminals; and

- a circuit-forming unit mounted to a base wall of the connection case, the circuit-forming unit having a plurality of male terminals protruding in the connection case through a plurality of male terminal piercing holes formed in the base wall, and a holder for supporting the male terminals,

- wherein among plurality of male terminal piercing holes formed in the base wall of the connection case, a fraction of

the male terminal piercing holes is/are reference holes formed to be smaller than the other male terminal piercing holes.

14. The joint connector according to claim 13, wherein the reference hole(s) is/are formed to be smaller out of the male terminal piercing holes formed in a central area of the base wall of the connection case.

15. The joint connector according to claim 13, wherein the reference holes are formed to be smaller out of the male terminal piercing holes formed at a plurality of positions radially spaced from a central area of the base wall of the connection case.

16. The joint connector according to claim 15, wherein the reference holes are male terminal piercing holes that are formed at a plurality of locations radially spaced from a central area of the base wall of the connection case, and are formed to be small by making an axis diametrical size with respect to a Y-axis of the male terminal piercing holes formed at locations spaced along an X-axis and an axis diametrical size with respect to the X-axis of the male terminal piercing holes formed at locations spaced along the Y-axis shorter than respective axis diametrical sizes with respect to corresponding axes of the male terminal piercing holes other than the reference holes.

17. A joint connector comprising:  
a plurality of connector housings each having a plurality

of terminal-accommodating compartments juxtaposed therein for accommodating connecting terminals, wherein:

each of the connector housing includes a connector housing-locking means composed of an interlocking recess portion and an interlocking protrusion portion provided respectively at a front and a rear of each of the connector housings on both side portions thereof, for stacking and combining the connector housings into a plurality of stages, such that an interlocking recess portion or an interlocking protrusion portion provided on one of the connector housings is respectively engaged with an interlocking protrusion portion or an interlocking recess portion provided on another one of the connector housings that is to be stacked;

each of the connector housing further includes an interlocking protrusion protruding on the other connector housing so as to engage with the connecting terminals accommodated in the terminal-accommodating compartments of the one of the connector housings, for preventing disengagement of the connecting terminals and detecting an incomplete insertion; and

in the connector housing-locking means provided at the front of each of the connector housings on both side portions thereof, the interlocking recess portion has a recessed groove opened in a lateral direction, and the interlocking protrusion portion has a lateral interlocking piece, extending forward and rearward, for being loosely inserted relatively into the recessed groove of the interlocking recess portion and engaging therewith,



and a vertical interlocking piece capable of contacting the interlocking recess portion, the interlocking protrusion portion being formed in a substantially L shape by the lateral interlocking piece and the vertical interlocking piece.

18. The joint connector according to claim 17, wherein a guiding recessed groove and a guide rib fitted thereto, for restricting a relative shift between stacked connector housings, are provided between the connector housing-locking means provided at the front and rear of the connector housing on both side portions thereof, and respective rear portion of the guiding recessed groove and the guide rib are formed into an inclined surface widening toward their bottom.

19. The joint connector according to claim 17, wherein a terminal-guiding slope portion projecting downwardly is provided on a lower wall near an terminal insertion hole in the terminal-accommodating compartment in the connector housing, and a corresponding upper portion of both side walls near the terminal insertion hole is provided with an undercut for engaging with the terminal-guiding slope portion.

20. The joint connector according to claim 17, wherein a rear portion of the terminal-accommodating compartment of the connector housing is opened upwardly, a stopper member is provided on upper portions of both side walls of the terminal-accommodating compartment above the terminal

insertion hole to cover the opening above the terminal insertion hole, and a corresponding lower portion of the terminal-accommodating compartment on both side walls is provided with a cut-out for receiving the stopper member.